

Application No.: 10/709,723

Docket No.: 22171-00016-US1

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A probe device for electrically testing an integrated circuit device, the probe device comprising:
an insulative body including at least one opening;
at least one supporter positioned in the insulative body inside the at least one opening of the insulative body, wherein the supporter comprises a helical spring with a spiral coil extending substantially in a same plane;
a probe positioned substantially at the a center of the supporter, wherein the probe is arranged to electrically connect to a pad of the integrated circuit device during testing; and
a conductive wire positioned in the insulative body and electrically connected to the supporter.
2. (Currently amended) The probe device of Claim 1, wherein the supporter is a helical spring further comprising two supporters positioned substantially in parallel with each other.
3. (Canceled).
4. (Currently amended) The probe device of Claim 3, A probe device for electrically testing an integrated circuit device, the probe device comprising:
an insulative body including at least one opening;
at least one supporter positioned inside the at least one opening of the insulative body,
wherein the supporter comprises a plurality of beams positioned in a radial manner and wherein the supporter further comprises at least one ring connecting the plurality of beams;
a probe positioned substantially at a center of the supporter, wherein

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the probe is configured to electrically connect to a pad of the integrated circuit device during testing; and a conductive wire positioned in the insulative body and electrically connected to the supporter.

5. (Canceled).
6. (Currently amended) The probe device of Claim-5 4, wherein the at least one opening is triangular, the supporter comprises three beams and at least one ring connecting the beams, and the included angles between two adjacent beams are substantially 120 degrees.
7. (Canceled).
8. (Currently amended) The probe device of Claim-5 4, wherein the at least one opening is quadrangular, the supporter comprises four beams, and the included angles between two adjacent beams are substantially 90 degrees.
9. (Currently amended) The probe device of Claim-5 4, wherein the at least one opening is hexagonal, and the supporter iscomprises a helical spring.
10. (Currently amended) The probe device of Claim-5 4, wherein the at least one opening is hexagonal, the supporter comprises six beams, and the included angles between two adjacent beams are substantially 60 degrees.
11. (Currently amended) The probe device of Claim-4, wherein the material of the probe and the supporter iseach comprise a material selected from the group consisting of copper, nickel, cobalt, tin, boron, phosphorous, chromium, tungsten, molybdenum, bismuth,

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indium, cesium, antimony, gold, silver, rhodium, palladium, platinum, ruthenium and their alloys.

12. (Currently amended) A probe card for electrically testing an integrated circuit device, the probe card comprising:
a circuit board having at least one test-connecting site;
a probe head having a plurality of probe devices arranged to electrically connect to pads of the integrated circuit device when testing,
wherein each of the probe devices comprises:
an insulative body including at least one opening;
at lease one supporter positioned in the insulative body inside the at least one opening of the insulative body, wherein the supporter comprises a helical spring with a spiral coil extending substantially in a same plane;
a probe positioned substantially at the-a center of the supporter; and
a conductive wire positioned in the insulative body and electrically connected to the supporter; and
an interface board, comprising:
at least one first signal-connecting site positioned on the-an upper surface of the interface board for electrically connecting the test-connecting site of the circuit board; and
at least one second signal-connecting site positioned on the-a bottom surface of the interface board for electrically connecting the conductive wire of the probe head.
13. (Cancelled).
14. (Cancelled).
15. (Currently amended) The probe card of Claim 14, A probe card for electrically testing an integrated circuit device, the probe card

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comprising:

a circuit board having at least one test-connecting site;

a probe head having a plurality of probe devices arranged to electrically connect to pads of the integrated circuit device when testing.

wherein each of the plurality of probe devices comprises:

an insulative body including at least one opening;

at least one supporter positioned inside the at least one opening of the insulative body,

wherein the supporter comprises a plurality of beams positioned in a radial manner and wherein the supporter further comprises at least one ring connecting the beams;

a probe positioned substantially at a center of the supporter;

a conductive wire positioned in the insulative body and electrically connected to the supporter; and

an interface board, comprising:

at least one first signal-connecting site positioned on an upper surface of the interface board for electrically connecting the test-connecting site of the circuit board; and

at least one second signal-connecting site positioned on a bottom surface of the interface board for electrically connecting the conductive wire of the probe head.

16. (Canceled).

17. (Currently amended) The probe card of Claim 16, wherein the opening is triangular, the supporter comprises three beams and at least one ring connecting the beams, and the included angles between two adjacent beams are substantially 120 degrees.

18. (Canceled).

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19. (Currently amended) The probe card of Claim ~~1615~~, wherein the opening is quadrangular, the supporter comprises four beams, and the included angles between two adjacent beams is substantially 90 degrees.
20. (Canceled).
21. (Currently amended) The probe card of Claim ~~1615~~, wherein the opening is hexagonal, the supporter comprises six beams, and the included angles between two adjacent beams is substantially 60 degrees.
22. (Currently amended) The probe card of Claim ~~1215~~, wherein, for each of the plurality of probe device devices, further comprises a pad is electrically connected to the an associated conductive wire and the an associated second signal-connecting site of the interface board.
23. (Currently amended) The probe card of Claim ~~1215~~, wherein the probe head further comprises a plurality of pads each electrically connected to the an associated conductive wire of the probe device and the an associated second signal-connecting site of the interface board.
24. (Currently amended) The probe card of Claim ~~1215~~, wherein the material of the each probe and the supporter is comprises a material selected from the group consisting of copper, nickel, cobalt, tin, boron, phosphorous, chromium, tungsten, molybdenum, bismuth, indium, cesium, antimony, gold, silver, rhodium, palladium, platinum, ruthenium and their alloys.
25. (Currently amended) A probe card for electrically testing an integrated circuit device, the probe card comprising:

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a circuit board, comprising:
a plurality of test-connecting sites; and
a plurality of conductive paths for connecting the test-connecting sites to the bottom surface of the circuit board; and
a probe head comprising a plurality of probe devices, wherein each of the plurality of probe device-devices comprises:
an insulative body including at least one opening:
at lease one supporter positioned in the insulative body inside the at least one opening of the insulative body,
wherein the supporter comprises a helical spring having a spiral coil extending substantially in a same plane;
a probe positioned substantially at the-a center of the supporter; and
a conductive wire positioned in the insulative body and electrically connected to the supporter and the-an associated conductive path of the circuit board.

26. (Canceled).
27. (Canceled).
28. (Currently amended) ~~The probe card of Claim 27, wherein the supporter further comprises A probe card for electrically testing an integrated circuit device, the probe card comprising:~~
a circuit board, comprising:
a plurality of test-connecting sites;
a plurality of conductive paths for connecting the test-connecting sites to a bottom surface of the circuit board; and
a probe head comprising a plurality of probe devices,
wherein each of the plurality of probe devices comprises:
an insulative body including at least one opening;
at lease one supporter positioned inside the at least one opening of the

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insulative body,

wherein the supporter comprises a plurality of beams positioned in a radial manner and at least one ring connecting the beams;
a probe positioned substantially at a center of the supporter; and
a conductive wire positioned in the insulative body and electrically connected to the supporter.

29. (Cancelled).
30. (Currently amended) The probe card of Claim ~~2928~~, wherein the at least one opening is triangular, the supporter comprises three beams and at least one ring connecting the beams, and the included angles between two adjacent beams are substantially 120 degrees.
31. (Cancelled).
32. (Currently amended) The probe card of Claim ~~2928~~, wherein the at least one opening is quadrangular, the supporter comprises four beams, and the included angles between two adjacent beams are substantially 90 degrees.
33. (Cancelled).
34. (Currently amended) The probe card of Claim ~~2928~~, wherein the at least one opening is hexagonal, the supporter comprises six beams, and the included angles between two adjacent beams are substantially 60 degrees.
35. (Currently amended) The probe card of Claim ~~2528~~, wherein the probe device further comprises a pad electrically connected to the conductive wire and the second signal-connecting site of the interface board.

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36. (Currently amended) The probe card of Claim 2528, wherein the probe head further comprises a plurality of pads each electrically connected to the an associated conductive wire of the probe device and the an associated second signal-connecting site of the interface board.
37. (Currently amended) The probe card of Claim 2528, wherein the material of the each probe and the supporter is comprises a material selected from the group consisting of copper, nickel, cobalt, tin, boron, phosphorous, chromium, tungsten, molybdenum, bismuth, indium, cesium, antimony, gold, silver, rhodium, palladium, platinum, ruthenium and their alloys.
38. (New) The probe device of Claim 1, wherein the probe and the supporter each comprise a material selected from the group consisting of copper, nickel, cobalt, tin, boron, phosphorous, chromium, tungsten, molybdenum, bismuth, indium, cesium, antimony, gold, silver, rhodium, palladium, platinum, ruthenium and their alloys.
39. (New) The probe device of Claim 4, wherein the included angles between two adjacent beams are substantially the same.
40. (New) The probe device of Claim 4, further comprising two supporters positioned substantially in parallel with each other.
41. (New) The probe card of Claim 12, wherein each of the plurality of probe devices comprises two supporters positioned substantially in parallel with each other.
42. (New) The probe card of Claim 15, wherein included angles between two adjacent beams are substantially the same.

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43. (New) The probe card of Claim 15, wherein each of the plurality of probe device comprises two supporters positioned substantially in parallel with each other.
44. (New) The probe card of Claim 25, wherein the probe device comprises two supporters positioned substantially in parallel with each other.
45. (New) The probe card of Claim 28, wherein the included angles between two adjacent beams are substantially the same.
46. (New) The probe card of Claim 28, wherein the probe device comprises two supporters positioned substantially in parallel with each other.